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ARROWHEAD

CONTINENTAL ARMY COMMAND

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Commander's Call

Among the most important parameters that guide combat developments are the views we take of men, materiel, tactics and logistics. There are, of course, other factors that are influential but these four simply cannot be overlooked.

MEN: Personnel utilization and management is our biggest problem. We must find ways to be more efficient with less people. This means, in concrete terms, smaller divisions with more combat effectiveness and versatility.

MATERIEL: We must move toward "conliferation," which is the opposite of "proliferation." We cannot afford a wide variety of "big money" items. We must make some hard choices—based upon our very best professional judgments and analyses.

TACTICS: Our main tactical limitations are related to reconnaissance, surveillance, target acquisition, and timely command decision-making. Our means to move and shoot—to attack the "located" enemy—and our means to logistically support our operations vastly overshadow our ability to find the enemy, to maintain contact once it is made (particularly in low intensity combat such as Southeast Asia) I believe we must put a much larger percent of our development and procurement effort into intelligence and communications.

LOGISTICS: Quite often, as tacticians, we fail to consider the logistical aspects of a battle. We have what might be called the "cornucopia syndrome." We plan our operations and let the horn-of-plenty back us up. From the platoon to the Pentagon we must develop a tougher and more precise system for establishing real requirements and controlling resources that are made available.

John Norton

JOHN NORTON
Lieutenant General,
U.S. Army
Commanding

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ARROWHEAD
COMBAT DEVELOPMENTS COMMAND

August 1971 No. 30

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WHO WON? A LASER "UMPIRE" SETTLES THE ARGUMENTS

by Maj. J. D. Coleman

News Item

FT. ORD, Calif. . . . The U.S. Army's Combat Developments Command Experimentation Command has announced the acquisition of a series of devices that promises to revolutionize the scientific experimentation being conducted at its field laboratory at Hunter Liggett Military Reservation.

Being developed for use with its basic attack helicopter team tests, the laser Direct Fire Simulator System (DFS), when combined with a Range Measuring System and a central computer, provides CDCEC for the first time with a means to obtain a real-time evaluation of air-to-ground combat maneuvers.

The soldiers in their fighting holes along the FEBA are tense as the sound of enemy tanks washes across their positions.

Their fingers tighten on their triggers. Crew-served weapons are nervously checked and re-checked.

Then the tension explodes with the staccato of gunfire and the enemy armor bursts from the woodline and plunges toward the friendly positions.

The landscape blazes with firepower.

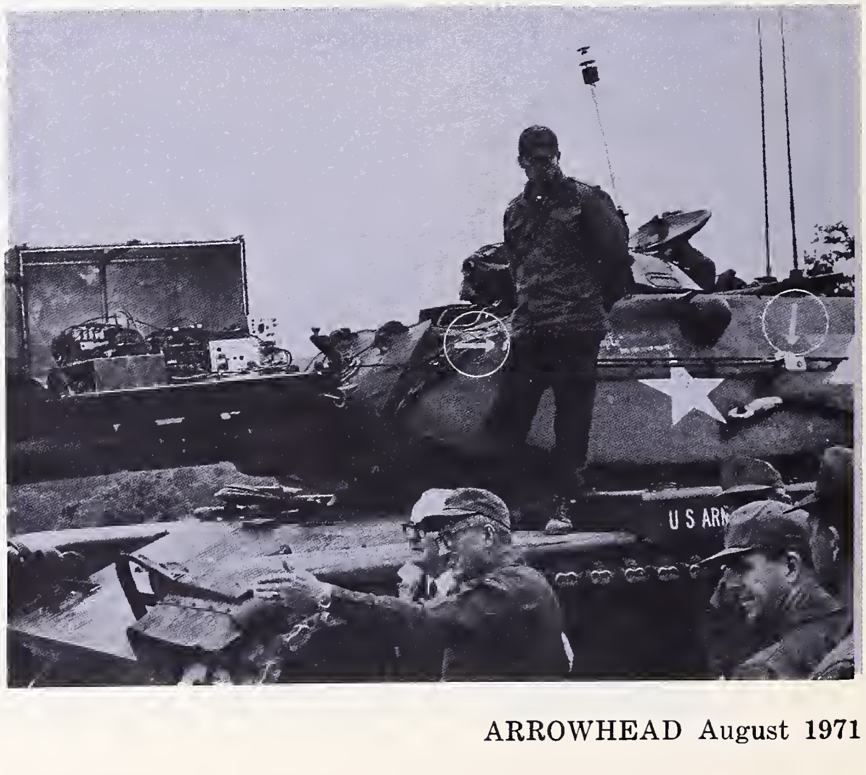
The tanks roll on, seemingly unchecked by the friendly fires.

Disaster seems imminent.

Suddenly, the action stops as men with white armbands run wildly about, shrilling their whistles and restoring order.

The noise of the simulated battle is replaced by the sounds of quarrelling men.

"We hit those tanks with anti-tank rockets when they broke through the clearing,"



CDCEC officials brief a visitor at the site of a tank-helicopter laser duel. The instrumentation package mounted on the barrel of the M60A1 tank is shown more completely on the opposite page. It consists of (left to right) protective bars for the laser gun and camera mount; the Huber mount for the gun camera; laser on mount; RMS-2 "B" unit; laser power unit; time code generator; and photocorder and package control box. In the main photo, two of the laser-sensitive detectors mounted on the tanks are depicted by arrows. The use of gun cameras, with time hacks recorded on the film, originally was the sole method of obtaining hit-kill data.

claim the grunts. "They never would've got this far in real life."

"Like hell you did," retort the tankers. "We blew you away before you got a round off."

The men in the white armbands—the umpires—separate the "combatants," hush their cacophony, then begin thumbing through their exercise manuals to determine who really won.

And so it goes, as it always has gone, in every maneuver, every field experiment or trial. The ultimate decision on whether maneuver or firepower was sufficient, whether new techniques or tactics were good enough for the ultimate crucible, envolved to the subjective, albeit professional, judgments of men with clipboards, pencils, and semi-scientific tabulations on firepower quotients.

As someone once said somewhere . . . "It's no way to run a railroad."

Well, at the Combat Developments Command Experimentation Command (CDCEC) field laboratory at Hunter Liggett Military Reservation, there not only is a better way to run a railroad—there's a brand new railroad.

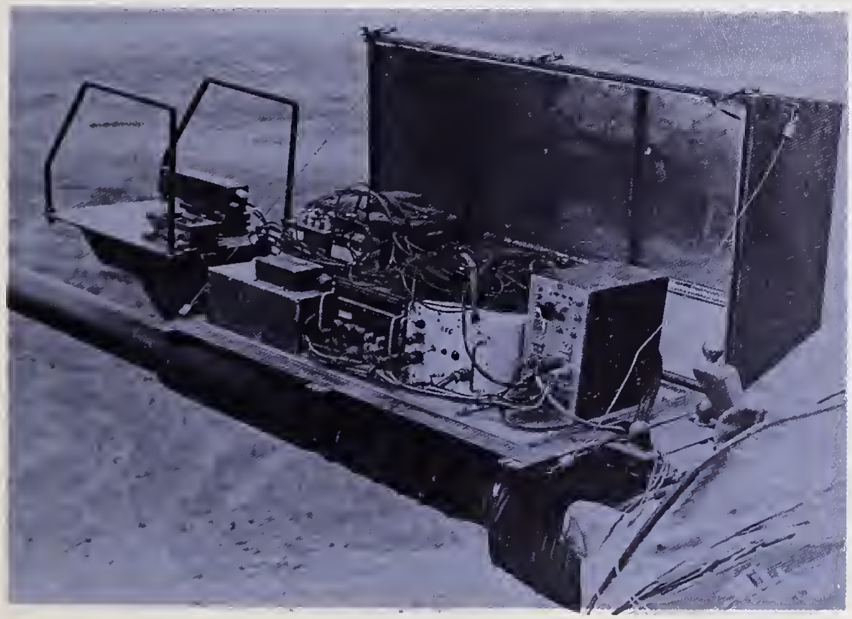
It's called a Direct Fire Simulator System (DFS).

Now, CDCEC has had a type of direct fire simulator called the "Hit—Kill indicator" for nearly 10 years. But it was only the rudimentary beginnings of an instrumentation plan that envisaged much, much more.

Later, as the command's instrumentation requirements grew, and the state-of-the-art produced the requisite hardware, CDCEC added a Range Measuring System (RMS-2), and followed this with a Central Computer System.

Then last summer, the command began testing a device it felt would revolutionize its scientific experimentation.

"THE ULTIMATE DECISION ON WHETHER NEW TACTICS WERE GOOD ENOUGH EVOLVED TO THE SUBJECTIVE JUDGEMENT OF MEN"



"THE MOST FUNDAMENTAL QUESTION ASKED IS WHETHER THE CHOPPER CAN SURVIVE ON THE MODERN BATTLEFIELD"

This was the portable Direct Fire Simulator that used a harmless laser beam as a firer-target engagement designator. Soldiers, armed with M-16 rifles, rigged with the DFS, would conduct a free-play, two-sided fire and maneuver exercise and, for the first time, participants could obtain a complete, up-to-the-minute picture of the combat as it happened.

The tests were very successful, and that set the stage for the next step—the big one—the acquisition and installation of Direct Fire Simulators on attack helicopters, tanks, armored personnel carriers, and armored reconnaissance vehicles.

Thus, for the first time ever, experimenters will be able to obtain instant hit-kill information from tank-helicopter duels. With this new system, CDC hopes to be able to obtain empirical data concerning the vulnerability and survivability of attack helicopters when pitted against an enemy armored column.

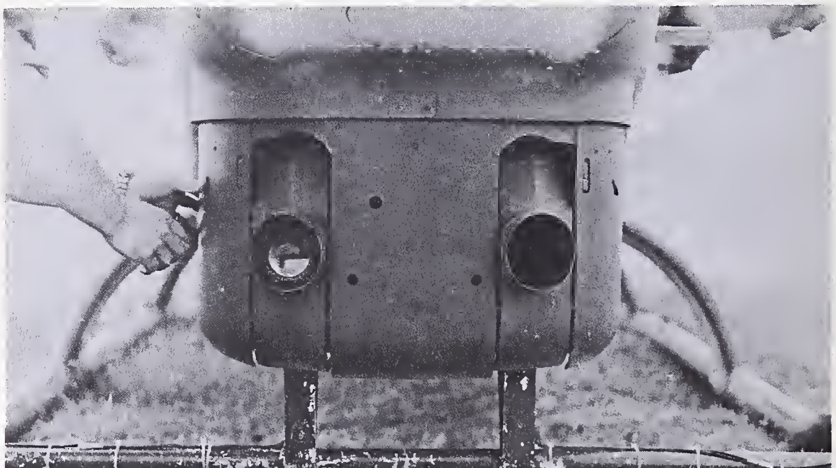
How important is this to the Army? It can be put this way: In just about every discussion on the role of helicopters in a mid-or high-intensity environment, the most fundamental question asked—and not answered, except in the most subjective and theoretical manner—is whether the chopper can survive on the modern battlefield.

One way to find out, of course, other than real combat, is a live-fire experiment, using towed and free-flight drones. But despite the ability of the aerial targets to reasonably duplicate flight paths and rudimentary evasive actions of Army aircraft, there is no substitute for having a smart, combat experienced flyer at the controls.

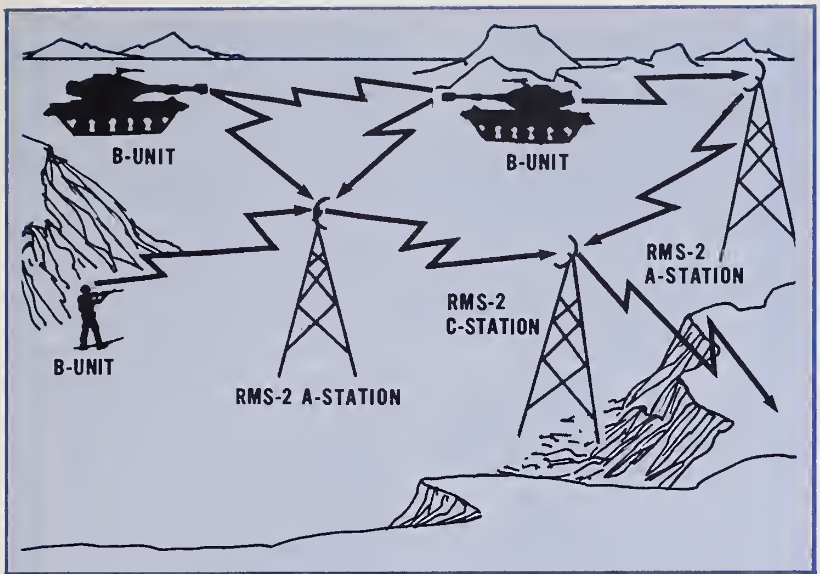
And that sure rules out live fire as an experimental means of proving survivability.

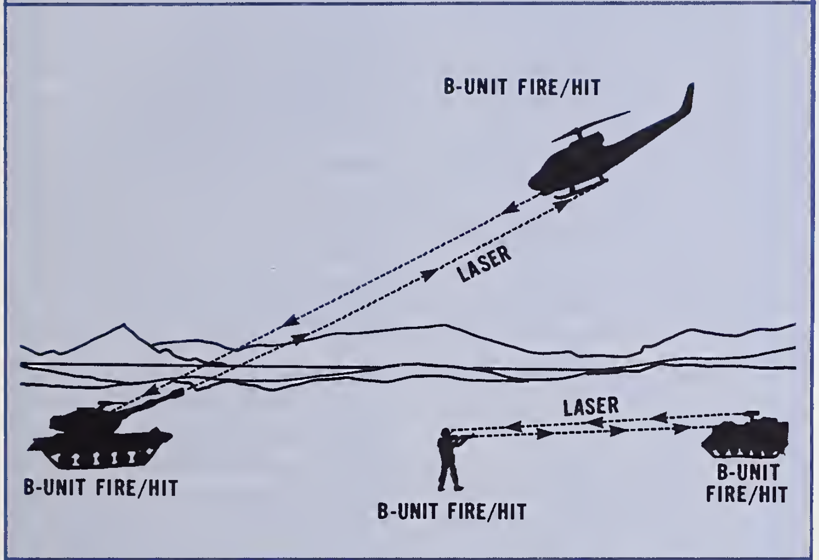
Which sets the stage for the Direct Fire Simulator System.

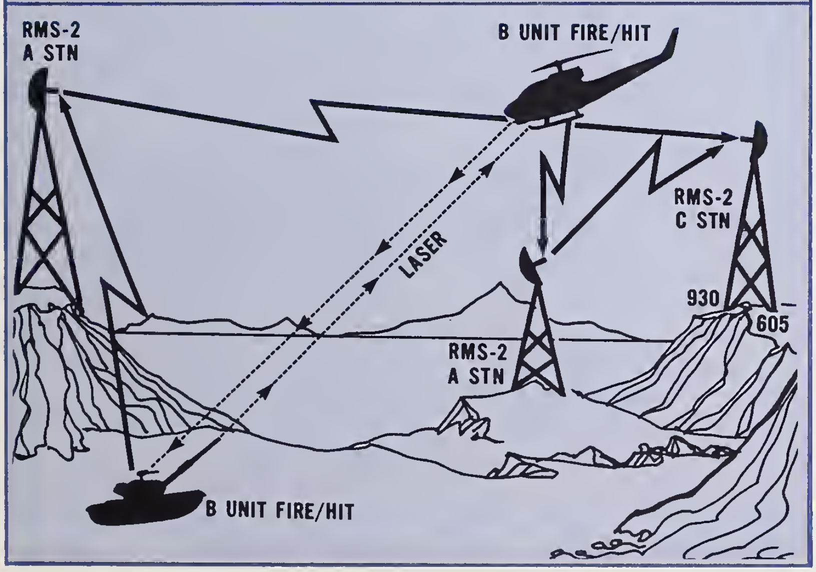
To really understand how the system works, it first is necessary to understand



This is a front view of the chin turret of an AH-1G Cobra with the laser gun in place on the right side of the turret. The laser is synchronized to simulate the function of the TOW missile system.







RANGE MEASURING SYSTEM (RMS-2) is depicted schematically on the top left. Fixed master stations, labeled "A" on the diagram, will be commanded by a computer, through a data link station, labeled "C", to obtain the range to a specific mobile station ("B" units) through the data distribution system. In addition, the computer will be able to send digital messages to mobile stations. Mobile stations will reply with a range pulse and any message that may have been entered into the station. Once the computer obtains four range readings from four separate master stations to a given mobile station, it will compute the position of the mobile station and store this information in its memory units.

Each "A" station is capable of interrogating 99 "B" units. A 23-pound manpack "B" unit has been designed to provide range measurements data for the ground elements used in the field trials. Position location also can be obtained with CDCEC's radar equipment using S-Band or X-Band beacons attached to the aircraft or vehicle.

DIRECT FIRE SIMULATOR'S (center) heart is a laser transmitter that can be attached to the tip of a machinegun, rifle, tank gun, or helicopter weapons system. Other parts of the system include a power pack, a pack containing the logic circuitry, and eight laser beam detectors. In a tank-helicopter duel, for example, each time a gunner pulls the trigger of his weapon, the laser transmitter sends out a beam of light. If the weapon is aimed correctly, the light beam is then picked up by one of the detectors placed on the equipment or the individual. The detector then converts the code that is carried by the laser beam into coded current pulses and relays it by means of the RMS to the Central Computer. In a fraction of a second the computer determines the slant range, compares the probability tables (weapons systems characteristics such as velocity, accuracy, etc.), and makes a hit/kill determination. This information is relayed by the RMS to the target where a cue, such as a smoke bomb, light, or buzzer is automatically activated and, concurrently, the target laser weapon is inactivated. The visual cue also permits feedback to the firer, to allow him to break off his engagement to attack other targets.

DIRECT FIRE SIMULATOR SYSTEM is shown on the bottom. Once the actions referred to above have occurred, the computer continues its task of producing a print-out. This enables evaluators to know immediately which combatant in the trial is doing the shooting. It tells how many rounds were fired, which rounds hit which combatant first, which were disabling or which were fatal. The third part of the total system is the data display. CDCEC uses two types of displays. The first is a tabular display to indicate status of instrumentation equipment, data quality, and status of troop units under evaluation. The second is a situation display enabling the test evaluators to monitor the experiment and insure that key events occur on schedule so that proper associated data is collected.

"THE COMPUTER DETERMINES HITS OR KILLS AND NOTIFIES THE ELEMENTS THAT THEY ARE OUT OF FURTHER PLAY"

how the Range Measuring System works in conjunction with the Central Computer.

The diagrams on page five graphically illustrate the RMS-2 operation. On the same page are diagrams showing the Direct Fire Simulator and the total system as it is packaged for the attack helicopter experiments.

Before CDCEC used the laser beam in any form, information was obtained as to the possibility of eye hazard in the use of the DFS system. The United States Surgeon General established safety standards for laser radiation based on detailed studies of eye safety hazards; and DFS transmitters were examined to determine if there could be any possible abnormal conditions which might result in energy density levels in excess of the specified limits.

After testing, it was found that the DFS laser would not emit radiations in excess of the Surgeon General's limitations and would be safe for use with CDCEC's soldiers.

But remember the dramatized scene at the beginning of this article? One point purposely left out was the description of the indirect fire simulation. The men with the white armbands, besides having to adjudicate fire and maneuver questions, also had to run around igniting artillery fire simulators and arbitrarily ruling combatants out of play.

Unfortunately, the laser DFS can't provide the answer to this problem, but CDCEC planners have some thoughts about the system that is needed to provide true realism in a fire-and-maneuver type of experimentation.

Considered as a logical next step is an indirect fire simulator that provides realistic firing signatures and achieves credible hit-kill probabilities.

As envisioned, the indirect firing simulation begins when a forward observer sees a target and radios the target location and composition to the Fire Direction Center (FDC). The FDC would then compute the sensing and send appropriate fire directions to the guns. Simultaneously, the settings would be sent to the Central Computer. The computer, knowing the position location of all guns, the ballistic characteristic of the projectiles and given meteorological information, would compute impact points.

Turning to its memory bank for lethality effects of the weapon, the computer would then establish the lethal limits around the computed impact points. Following a search of its memory for any personnel or equipment located within the lethal areas (data derived from the RMS), it then would determine hits or kills to be scored and would notify the maneuver elements through the RMS data link that they were ruled out of further play. The data link also could activate a visual cue on the target, such as a smoke bomb, light or buzzer, such as is done with the direct fire system.

But regardless of the type system used, the automation provided by CDCEC's instrumented field laboratory at Hunter Liggett allows the conduct of objective, scientific field experiments. It's the best way CDC knows to assure realism, to control the experiment, and to obtain the data needed.

It's an infinitely better way to run a railroad, by anybody's standards.

OCRD: SEVEN NEW INITIATIVE PROPOSALS

In testimony before the Defense Subcommittee, of the Committee on Appropriations, U.S. Senate earlier this year, Lieutenant General William C. Gribble, Jr., the Army's Chief of Research and Development unveiled the Army's NEW INITIATIVES program. This program, which has great significance for the Army in general, but for Combat Developments Command in particular, is designed to exploit new ideas and to expedite on-going projects.

The following is the statement by LtGen. Gribble:

1. IMPROVEMENTS FOR THE INDIVIDUAL SOLDIER.

The plan for a smaller, modern Army in the near future requires that we achieve new efficiencies and effectiveness in the management and productivity of our fundamental resource—the individual soldier.

We are increasing our research and development effort in several areas dedicated to improving the lot of the individual soldier: his safety, prestige, effectiveness, comfort, and survivability. For example, efforts have been accelerated to provide the soldier with better protective equipment, such as body armor and a helmet.

Battlefield safety and combat effectiveness will be improved by the development of improved equipment for detection and neutralization of mines and booby traps. Our focus is on all aspects of the military life of the soldier, in garrison as well as in the field. Our new efforts include improved food and supply service systems and extends to improvements in non-material matters, such as improved manpower management practices, incentives and rewards that increase the attractiveness of military service to capable men.

Further, our expanded research and development program for the individual soldier is characterized by the systematic integration of the numerous separate but interacting topics that impact on the soldier. By this I mean the Army is viewing recruiting, training, career management, facilities and family services in their totality, as the professional soldier does. To do this, we propose to create a new small, high caliber institute that will examine these topics, as viewed by the individual soldier, and their impact on him.

2. FORWARD AREA AIR DEFENSE SYSTEMS

There is an urgent requirement for improvements to existing forward air defense systems to complement SAM-D. When designed, our current weapons were equal to the threat of the times and were the best that technology could then give us. Now the threat has increased; but so has technology, which can now give the required new capacity. Evaluations are now underway to determine the possibility of improving CHAPARRAL and VULCAN.

"THIS PROGRAM IS DESIGNED TO EXPLOIT NEW (RESEARCH AND DEVELOPMENT) IDEAS AND TO EXPEDITE ON-GOING PROJECTS"

"OUR TACTICAL OPERATIONS CENTERS...ARE NOW ESSENTIALLY MANUAL"

3. DYNAMIC DEFENSE.

"Dynamic Defense" is our next new initiative. Since we now hold the ground over which we may have to fight, we are in a position of being able to prepare that ground prior to the advent of hostilities. A technological base to accomplish this program has already been established. Our FY 72 efforts will primarily be concept formulation utilizing this base.

4. AIRCRAFT ELECTRONIC (EW) PROTECTIVE EQUIPMENT.

The fourth new initiative consists of efforts to increase the ability of our aircraft to successfully operate against modern air defense weapons.

5. TERMINAL HOMING.

Terminal Homing gives the Army a capability it has never had before. We have always talked about our desire to have a first round hit capability; with terminal homing we now have a means of achieving it.

Until now the most practical way to defeat moving, hard, point targets, such as tanks and armored personnel carriers, has been with line-of-sight surface launched weapons; thus, necessarily, short range weapons. Faced with the large armored threat in Western Europe, it would be preferable to employ indirect fire, surface launch, with the attendant advantage of reduced vulnerability and longer range, and to use armed helicopters armed with "fire and forget" missiles to reduce the aircraft exposure time to a minimum.

Terminal homing provides a means to do both. Terminal guidance offers the chance to deliver non-nuclear munitions to great ranges with extreme accuracy and also to deliver nuclear warheads directly on their intended targets.

6. INTEGRATED BATTLEFIELD CONTROL SYSTEM (IBCS)

In recent years, the Army has made significant improvements in its capabilities for firepower, mobility, information gathering, communications, and combat service support. However, the ability to integrate and control these functions of land combat has not kept pace. The task of integrating and controlling these functions is called "command and control."

Our tactical operations centers which aid commanders in performing their command and control are now essentially manual. Modern technology—particularly in the area of automatic data processing—can provide a much improved capability to integrate and control the functions of land combat. The Army has been in the process of defining the Integrated Battlefield Control System, or IBCS. IBCS is defined as the structured framework of personnel, organizations, concepts, doctrine and equipment integrating the functions of combat into a coherent operation.

The purpose of an IBCS is to facilitate decision making for the effective use of combat power.

7. AERIAL SCOUT.

Currently the Army's tactical air mobile capability is degraded because the aerial scout, the Light Observation Helicopter (LOH), is limited in its performance of several elements of the scouting mission.

The scout is limited in its ability to navigate tactically at low level. Target acquisition is now limited essentially to those targets acquired by the unaided vision of the crew members. The aerial scout is generally unable to rapidly and accurately locate his own position, and more importantly, to hand off to a gunship the location of a target. The scout currently designates targets through the use of smoke or by passing estimated coordinates, a system with obvious limitations. The scout's mission performance is severely lessened by conditions of reduced visibility, and there is concern about the scout's survivability in a mid-intensity conflict.

In this seventh and last new initiative, we are focusing on the incompatibility of the scout and the gunship by concentrating on improving the scout. This new initiative improves the LOH mission performance as a day/low visibility/night scout.

STANLEY R. RESOR: SIX YEARS IN RETROSPECT

On June 29, 1971, The Honorable Stanley R. Resor said farewell to the Army after serving six years as its Secretary. Noted guests in attendance were Secretary of Defense Melvin R. Laird, and Army Chief of Staff William C. Westmoreland.

Also in attendance at Ft. Myer, Va., was Lieutenant General John Norton. The farewell address by Mr. Resor so impressed General Norton that he asked the Arrowhead *to reprint the remarks so that members of the command could benefit by their contents.*

Thank you, Secretary Laird and General Westmoreland.

I want to thank all of you who are here today for being here, and for the friendship and support which you have given me over the past six years. Whatever good has been accomplished could not have been without your help.

I shall speak briefly of the past. The future is what you will deal with. The years I have been privileged to serve with you were not easy ones for the Army, but their record contains much to the Army's great credit.

The six years of my service have been those of the Vietnam war. They have been a difficult time, both for the Army and for our country.

In the country as a whole, there has been division. There has been discouragement as to whether we really can deal with the large issues which confront us both at home and abroad. Some citizens have

"THE REAL THREAT IS TO KEEP HEALTHY QUESTIONING FROM TURNING INTO DESPAIR"

lost confidence in the very institutions of government which hold our nation together.

For the Army, the war has been long and hard. We have had to adapt military resources to a struggle which was social, economic, and political as well. We have had to work closely with a distant people of alien background and culture. We have had to do so in the face of vigorous questioning of policy by many sincere persons at home.

Measured against these difficulties, the Army can be proud of its performance. You have achieved the objective of giving the South Vietnamese time to strengthen and equip their armed forces, to build their governmental institutions, and to begin social and economic reform. Beyond this, the ultimate result depends on the Vietnamese themselves. The United States Army has done all it was asked to do. It has done it well.

There have been other important achievements. We have, through our forces in NATO, maintained stability in Western Europe, the area most vital to the security of the United States.

During this same period the Army has had to deal with new problems and challenges brought in from civilian society. We have experienced new militancy among minority groups, and new attitudes and behavior patterns among young people. The Army has not been exempt from the questioning of old ways. It has been subject to the strains of a society which is reexamining all its values.

Thus for the Army it has been a time of activity, accomplishment and change—and perhaps of the feeling that these efforts were not always appreciated by the public at large, and that the Army was paying the price for unpopular decisions of others.

The challenge for the future is how we react to these past six years.

For the country as a whole I think the real threat is to keep healthy questioning from turning into despair—into a lack of faith in our ability to meet problems which are now clearer to us. I think in years past we were a little naive about the difficulties we do face. We have for many years underestimated and neglected growing social problems at home, and at the same time overestimated our power to influence events internationally.

But in recognizing our limitations, we must remember that there is a great deal we can do. We should not allow frustration over the lack of simple solutions to keep us from realizing how much has been done, and how much can be done, to solve hard problems if talented people are willing to work hard at it.

The Army, too, must be careful how it reacts to these past six years. We must resist the temptation to blame our difficulties on the press, or lack of public support, or things beyond our control. That is not a constructive approach. Some of the Army's problems we did not create. But that is no excuse for failing to deal with them.

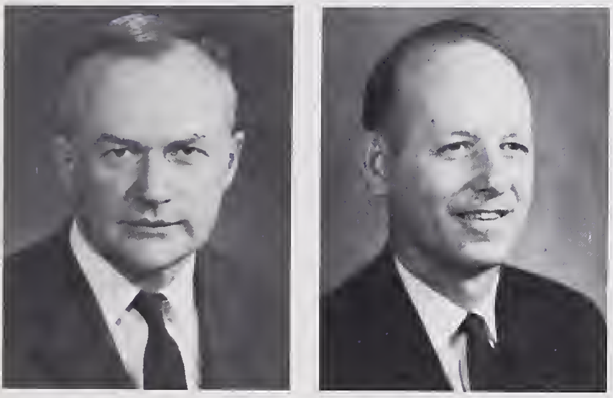
"MILITARY SERVICE IS PUBLIC SERVICE . . . AND NO PUBLIC SERVICE IN THIS COUNTRY IS MORE IMPORTANT"

It is important that the Army stay confident of itself. The challenges of the future can be handled if the Army is willing to re-examine itself from time to time. We need to keep what is good and helpful, and find new approaches where necessary to perform the Army's mission better. If the truth be known the Army is more skilled and flexible in dealing with social change, while still preserving traditional values, than most institutions.

The Army is a large institution. Like all large institutions, it runs the danger of becoming impersonal, of disregarding the needs of its people, of stifing individual initiative. Institutions, like people, need perodically to take stock. We need to see what can be done to eliminate those characteristics which unnecessarily diminish the individual, and emphasize those which offer an opportunity to find fulfillment in doing a job well.

I believe that we are already on the road to doing just that. One example is the encouraging progress in our efforts to improve race relations. Another good example is the Modern Volunteer Army program—not primarily as it relates to increasing enlistments, but rather in its goal of reanalyzing and restructuring the way we handle men in the Army. We will preserve the traditions and values which have made our Army great, while accepting the challenge to make the Army better.

And that better Army in the years ahead will be more essential than ever before. The United States, whether we like it or not, is a world power. Increasingly, I hope, we are coming to realize that we live in an era of nuclear parity, when nuclear weapons no longer are a credible deterrent to all hostile and aggressive acts. Today it is conventional forces which constitute politically effective military force. There is no cheap or easy substitute—the alternatives are either unacceptably dangerous or ineffective.



Former Secretary of the Army Stanley R. Resor (left) and his successor, former Assistant Secretary of Defense (Administration) Robert F. Froehlke. The Honorable Mr. Resor, who has been secretary since July 2, 1965, has returned to law practice.

I am confident that the United States will pass through this period of questioning and doubt and will not turn inward to seek the delusive and temporary comfort of a new isolationism. I believe we shall continue to meet our responsibility to support world stability and peace. That is the only course that will work in the long run. It is the only one consistent with the American spirit and conscience. And if I am right, then the Army will have an increasingly important role in the years to come.

The years ahead will not be easy. But I have no doubt that the men and women of the Army will continue to rise to whatever is demanded of them. You will continue to build an organization which is not only a keystone of national defense and world peace and stability, but also a humane institution with careers which attract some of our most talented citizens. Military service is public service—and no public service in this country is or will be more important for the forseeable future.

I have been privileged to know well many of you who have been leaders of the Army during my tenure. I know the talent and hard work you have given your country. Under Bob Froehlke's leadership, I am sure that your contributions will grow.

I have not been able to know personally the millions of officers, noncommissioned officers and men who have worn the Army uniform during these six years, or the civilian workers who have supported them. But I know that the strength of our forces lies not in machines and tools and weapons, but in the people who make it up. Their talent, sacrifice, and distinguished service have brought the Army to the highest level of leadership and service in our history.

I cannot close without saying once more what I have said to many of you in private—that these have been the most personally rewarding years of my life. The hours have been long and the problems difficult—but the rewards of public service do not involve ease or comfort. They consist of having the opportunity to spend the productive years of one's life working on problems that really count, and working for and with men and women of immense patriotism and talent. Those rewards I have had in abundance.

And so I say good-bye. I am proud to have had the privilege of serving the United States Army in this time of challenge. I could not have asked for a finer group of men and women to work with, and as friends. I have not the slightest doubt that the future will be bright.

Thank you.

Combat Support Hospital...

Total Treatment In Military Medicine

by SP5 Rick McQuiston

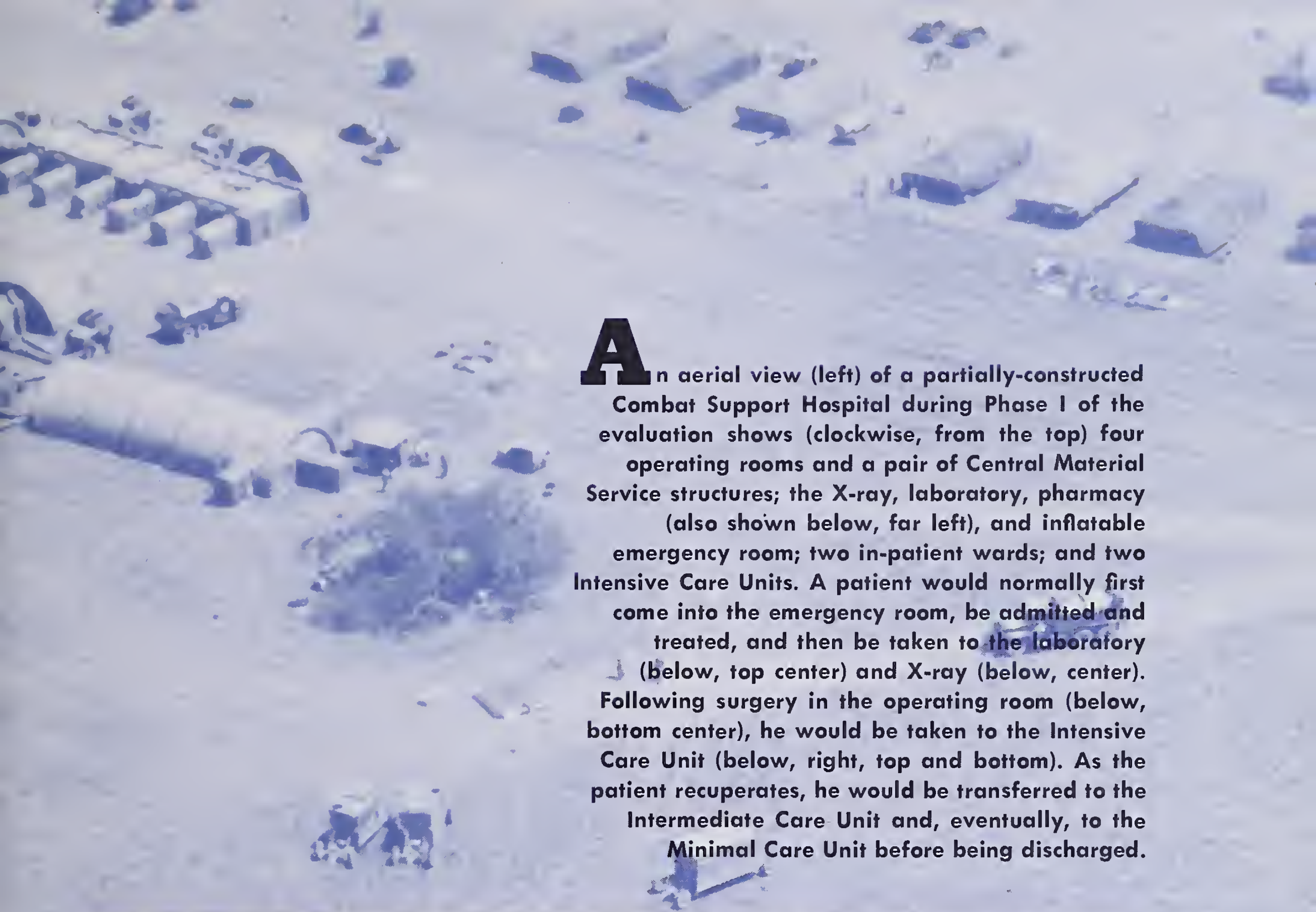
Inside the revamped barracks on the grounds of William Beaumont General Hospital, Colonel Douglas Lindsey quietly peels the cellophane wrapper from a cigar as a number of officers and NCOs scurry, papers in hand, from desk to desk.

Outside, the Texas sun beats down on "a bunch of hot dogs cut in half lengthwise and blown up and sitting on the ground" a few hundred yards from the barracks.

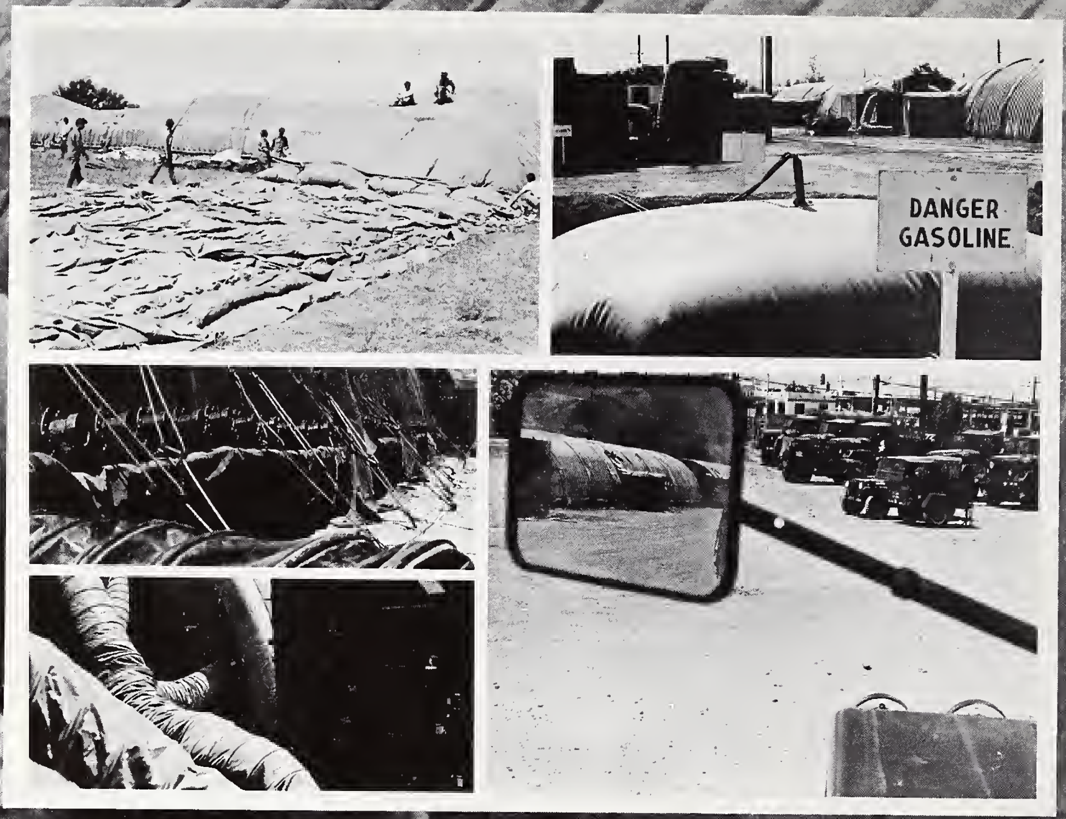
Col. Lindsey twirls the cigar in one hand and, half-turned, picks up a book of matches lying beside his flop-brimmed jungle hat and plastic eye patch, which he wears due to a previous injury.

The colonel, a Medical Corps officer board-certified in both surgery and preventive medicine, speaks with cool assurance of the Combat Support Hospital, which he and a hand-picked staff of some 40-plus medical specialists are field evaluating.

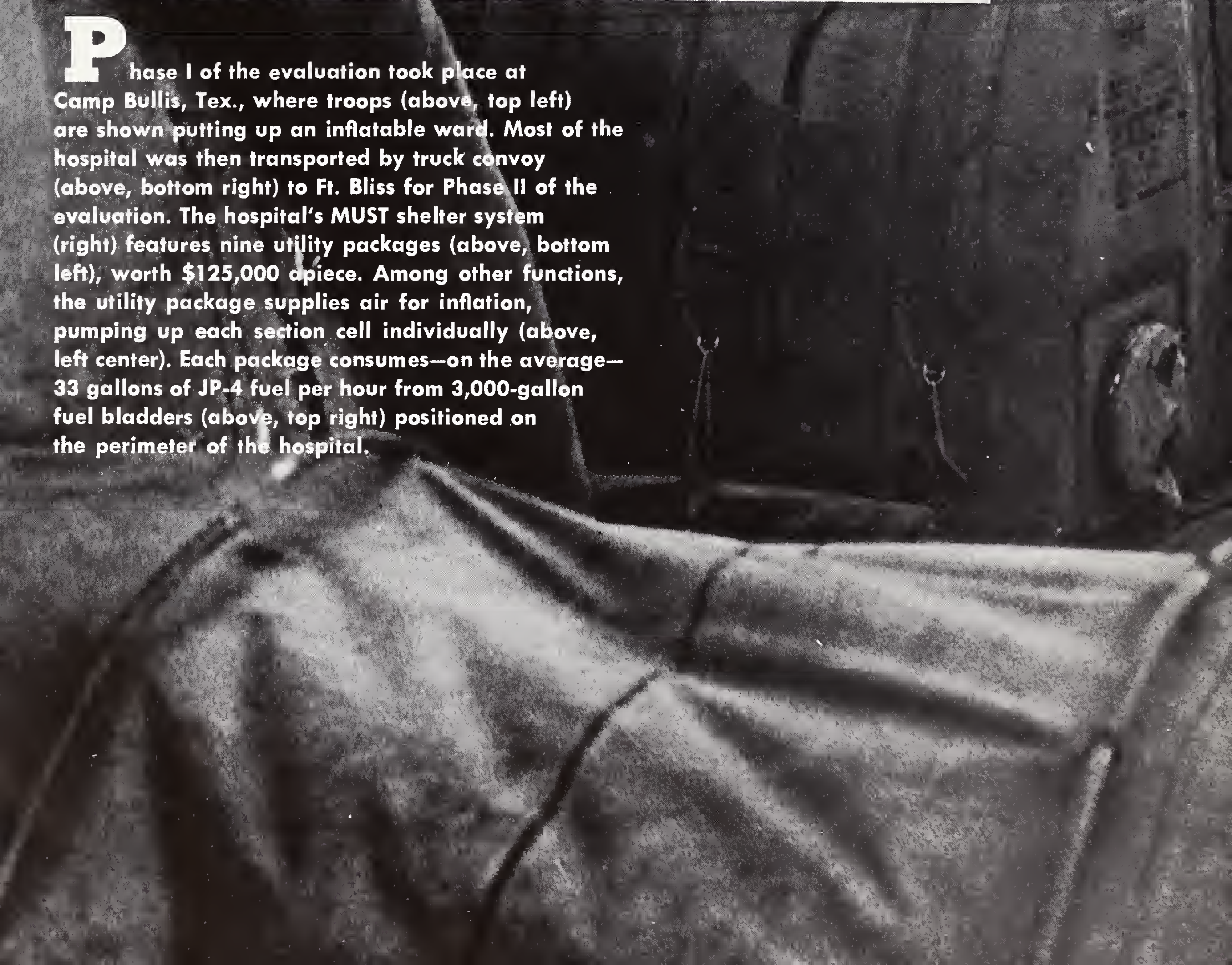
continued on page 19

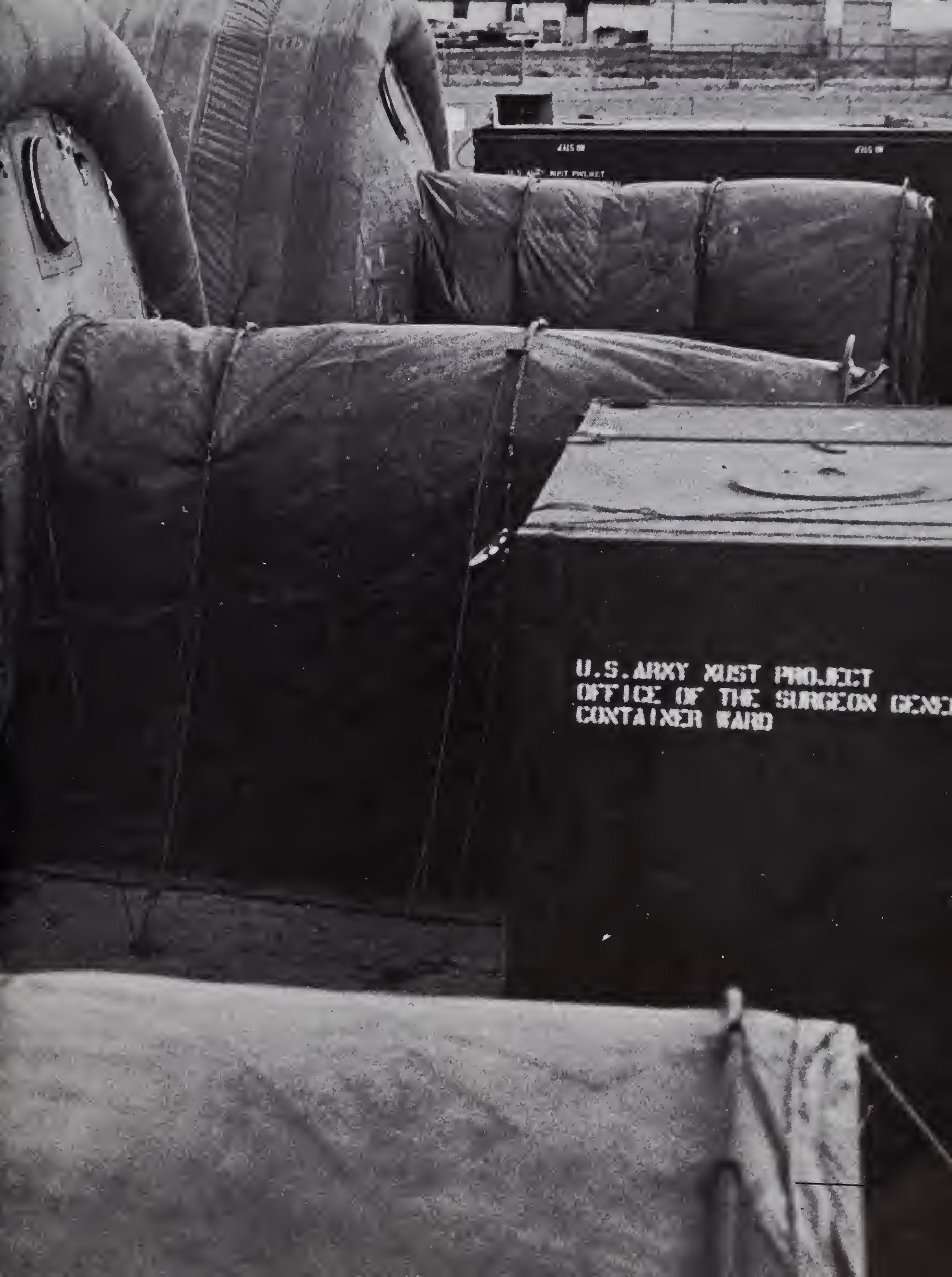


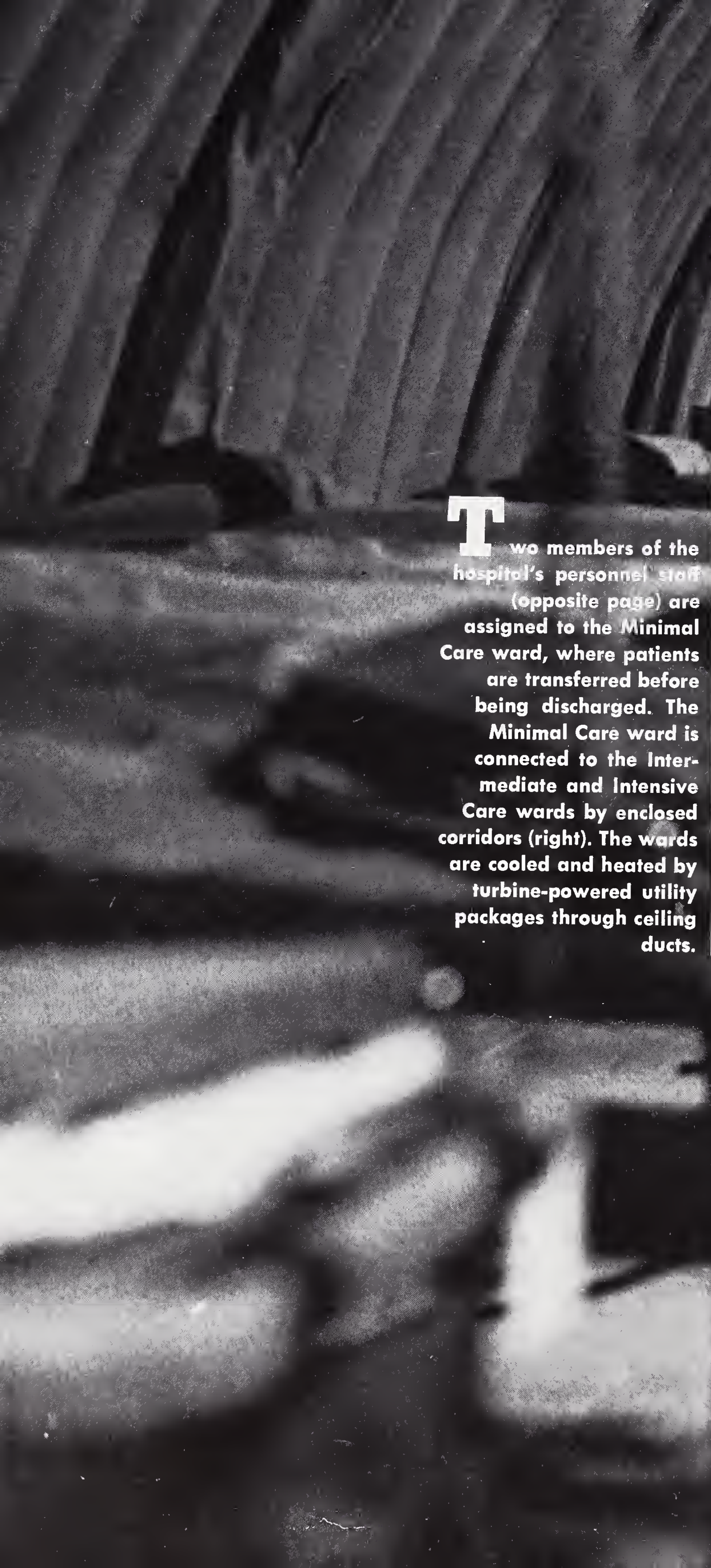
An aerial view (left) of a partially-constructed Combat Support Hospital during Phase I of the evaluation shows (clockwise, from the top) four operating rooms and a pair of Central Material Service structures; the X-ray, laboratory, pharmacy (also shown below, far left), and inflatable emergency room; two in-patient wards; and two Intensive Care Units. A patient would normally first come into the emergency room, be admitted and treated, and then be taken to the laboratory (below, top center) and X-ray (below, center). Following surgery in the operating room (below, bottom center), he would be taken to the Intensive Care Unit (below, right, top and bottom). As the patient recuperates, he would be transferred to the Intermediate Care Unit and, eventually, to the Minimal Care Unit before being discharged.



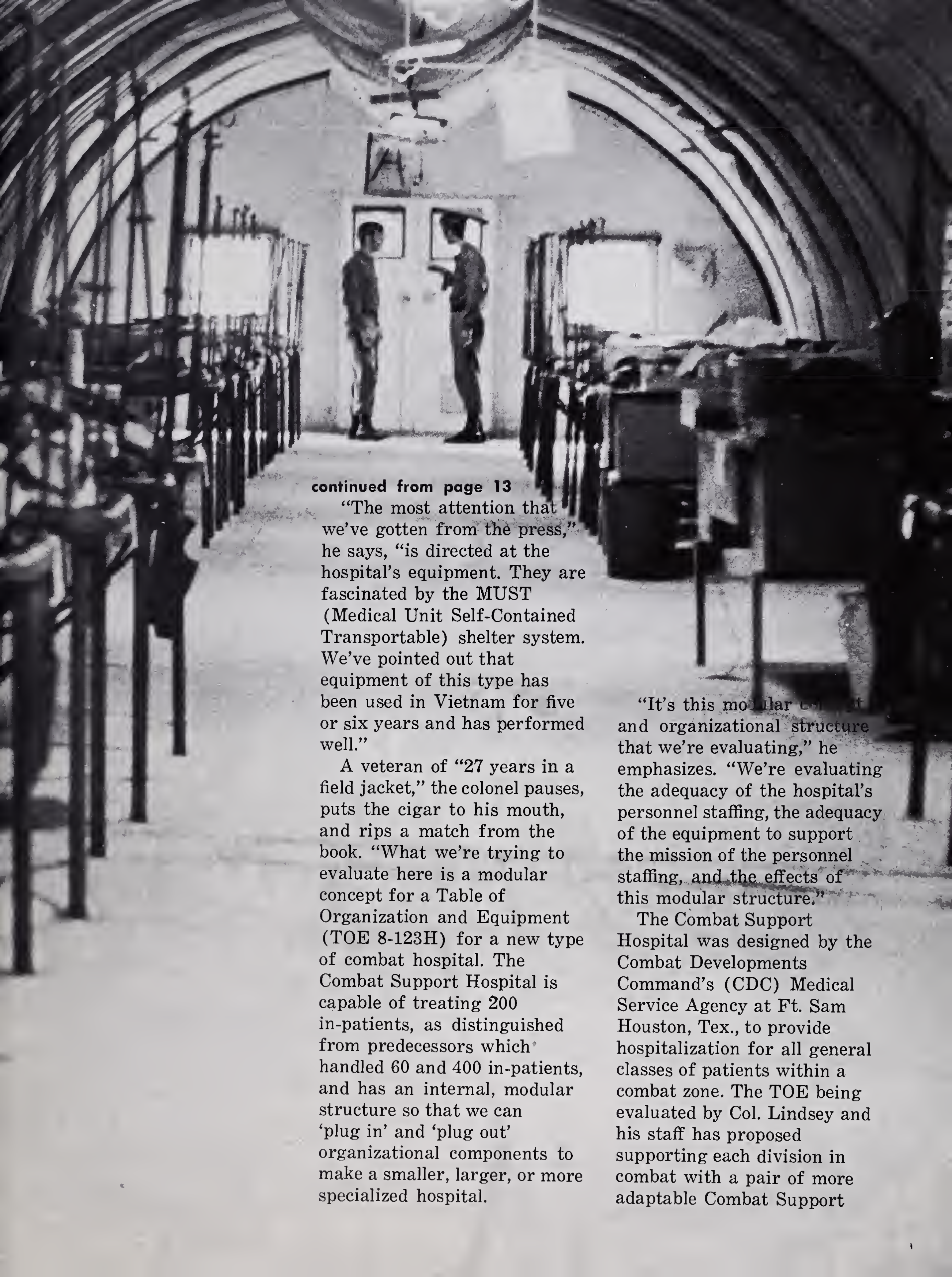
Phase I of the evaluation took place at Camp Bullis, Tex., where troops (above, top left) are shown putting up an inflatable ward. Most of the hospital was then transported by truck convoy (above, bottom right) to Ft. Bliss for Phase II of the evaluation. The hospital's MUST shelter system (right) features nine utility packages (above, bottom left), worth $125,000 apiece. Among other functions, the utility package supplies air for inflation, pumping up each section cell individually (above, left center). Each package consumes—on the average—33 gallons of JP-4 fuel per hour from 3,000-gallon fuel bladders (above, top right) positioned on the perimeter of the hospital.




U.S.ARMY MUST PROJECT
OFFICE OF THE SURGEON GEN
CONTAINER WARD



Two members of the hospital's personnel staff (opposite page) are assigned to the Minimal Care ward, where patients are transferred before being discharged. The Minimal Care ward is connected to the Intermediate and Intensive Care wards by enclosed corridors (right). The wards are cooled and heated by turbine-powered utility packages through ceiling ducts.



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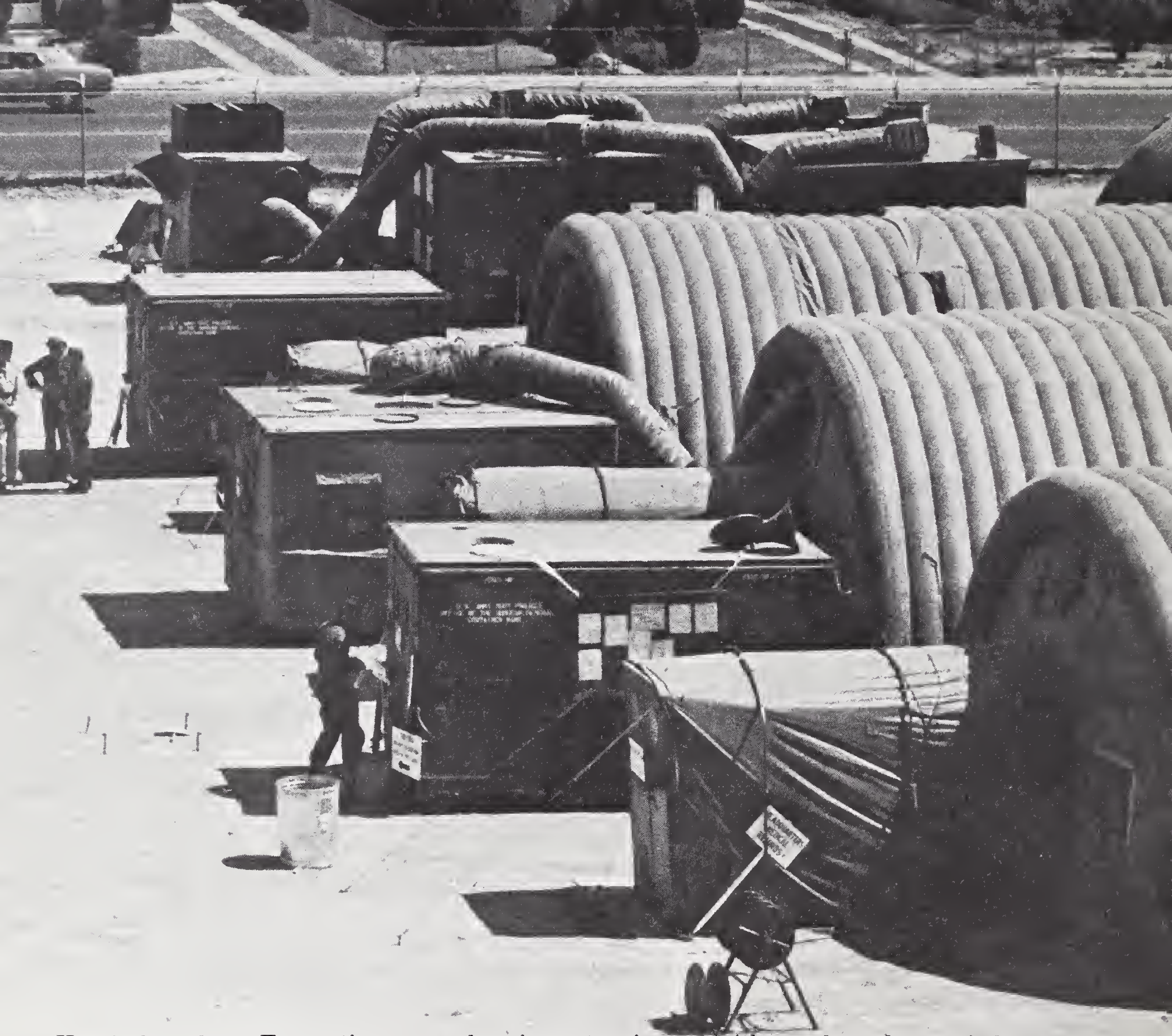
"The most attention that we've gotten from the press," he says, "is directed at the hospital's equipment. They are fascinated by the MUST (Medical Unit Self-Contained Transportable) shelter system. We've pointed out that equipment of this type has been used in Vietnam for five or six years and has performed well."

A veteran of "27 years in a field jacket," the colonel pauses, puts the cigar to his mouth, and rips a match from the book. "What we're trying to evaluate here is a modular concept for a Table of Organization and Equipment (TOE 8-123H) for a new type of combat hospital. The Combat Support Hospital is capable of treating 200 in-patients, as distinguished from predecessors which handled 60 and 400 in-patients, and has an internal, modular structure so that we can 'plug in' and 'plug out' organizational components to make a smaller, larger, or more specialized hospital.

"It's this modular concept and organizational structure that we're evaluating," he emphasizes. "We're evaluating the adequacy of the hospital's personnel staffing, the adequacy of the equipment to support the mission of the personnel staffing, and the effects of this modular structure."

The Combat Support Hospital was designed by the Combat Developments Command's (CDC) Medical Service Agency at Ft. Sam Houston, Tex., to provide hospitalization for all general classes of patients within a combat zone. The TOE being evaluated by Col. Lindsey and his staff has proposed supporting each division in combat with a pair of more adaptable Combat Support



Hospitals and one Evacuation Hospital, instead of the present arrangement of two Evacuation Hospitals and one Mobile Army Surgical Hospital.

The evaluation, which ended in June, began back in mid-March when the Continental Army Command activated the Combat Support Hospital (Provisional) at Ft. Sam Houston and the Surgeon General of the Army's office provided an evaluation staff to test the hospital concept and a professional staff to man the hospital.

Phase I of the evaluation consisted mainly of personnel and equipment assignment (the hospital, fully-staffed, totals 230 personnel), culminating in May with a field exercise at Camp Bullis, Tex. "This was an evaluation of the function of this hospital as a total element in its relation to a simulated combat environment—and I'm not just talking about a physical environment of climate and terrain and combat, but the hospital's relationship to other units: the unit it supports and the units that support it," Col. Lindsey says.

"We wanted to find out to what extent the hospital was dependent or independent; to what extent the hospital was mobile; and if there were any limitations on this mobility."

To do this, the Combat Support Hospital wrapped up Phase I by packing up the hospital (minus four wards, two operating rooms, one Central Materiel Service, and half of the hospital's 200 in-patient capability) and moving it via a 24-truck convoy to Ft. Bliss, Tex.

Col. Lindsey, who made the 610-mile trek driving a deuce-and-a-half to observe firsthand the hospital's

continued on page 29

We need men who are experienced, skilled and dedicated.
Like you.
Your future, your decision. Stay ARMY.

Innovative Personnel Techniques Aid Re-up Program

by SP5 Bill Witcraft

General William Westmoreland, Army Chief of Staff, recently stated that the biggest challenge the Army faces, short of combat on the battlefield, is to more than double its enlistments and re-enlistments.

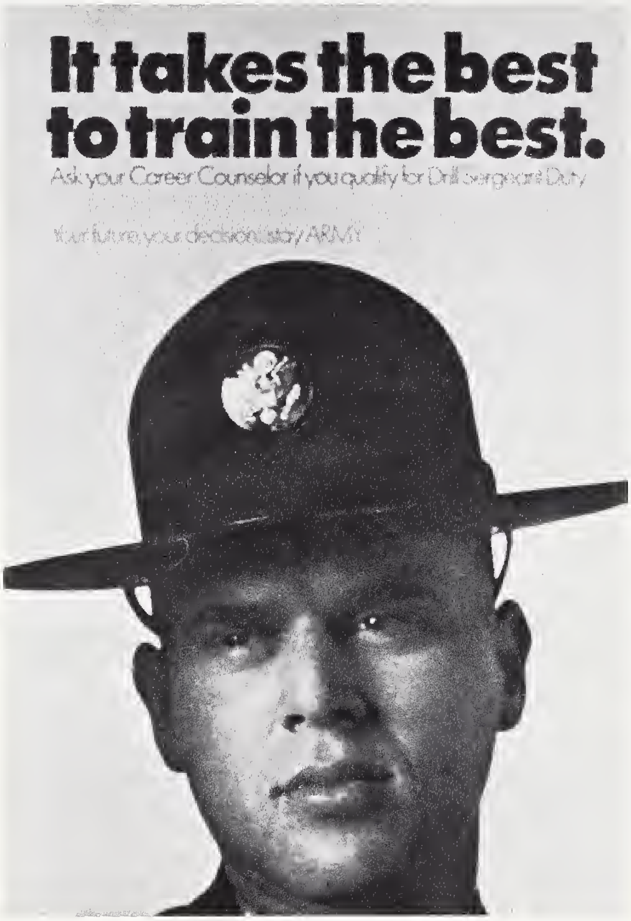
Combat Developments Command (CDC) is meeting this challenge. In April 1971, Lieutenant General John Norton, CDC Commanding General, sent a letter to all commanders in CDC urging their active support "in making the Modern Volunteer Army a reality."

General Norton said: "One way to achieve this goal is by attaining the recently-increased Army reenlistments objectives. The retention on active duty of well-motivated and experienced soldiers is of critical importance to the Army."

Yet, in order to retain "well-motivated and experienced soldiers", the Army must demonstrate that a career decision will benefit them. An innovation, created by Colonel John Lycas, CDC Director of Personnel, is a team of three senior noncommissioned officers, headed by Sergeant Major John Almeida, Jr., who visits with potential reenlistees to discuss, in the light of their personal experiences, the benefits in making the Army a career.

Along with SgtMaj. Almeida, the team is composed of the Personnel Management Supervisor, and the CDC Career Counselor.

According to SgtMaj. Almeida, "When we talk to the po-


It takes the best to train the best.
Ask your Career Counselor if you qualify for Drill Sergeant Duty
Your future, your decision/stay ARMY

Stay where history is made.

tential reenlistee, we are not trying to glamorize the service. What we are trying to do is tell him exactly what it is, or 'to tell it like it is.' We tell him the advantages of making the service a career, along with the disadvantages."

CDC's quota for reenlistment is one per-cent of assigned enlisted strength per month. Although CDC has met its reenlistment quota every month (averaging approximately 25 per month), some proposals currently being considered, such as better living conditions, stability of duty assignments, and pay raises, should prove to be excellent incentives towards obtaining more reenlistments.

"Reenlistment information in connection with Modern Volunteer Army is continually being disseminated to major subordinate commands," notes Major A. V. Saputo, CDC's Reenlistment Officer. "However, with the challenge facing us in making the Modern Volunteer Army a reality, it is everyone's duty, officers and NCOs alike, to personally involve themselves with the job of retaining qualified soldiers."

One well-motivated soldier, deciding to "do something to help the Army and myself," did just that in a ceremony at CDC Headquarters.

Specialist Five David L. Rehms, a Computer Operator assigned to the Directorate of Automatic Data Processing and Management Information Systems, reenlisted for six more years and is $10,000 richer because of his VRB (Variable Reenlistment Bonus).

According to SP5 Rehms, "I decided to take advantage of the many opportunities the Army provides a person to further his education. I wanted to become a computer operator because of the challenges.

Since the days of George Washington, enlistments and reenlistments have been a challenge. Today it is the biggest challenge the Army faces. At Combat Developments Command, where challenges are the very essence of its existence, innovative practices are paying off.

For God and Country

What becomes of a nation if it loses its faith? Read the history of the French Revolution.

Here are some of the facts. In 1793 the religion of "reason" was proclaimed in Paris, France. The revolutionaries wanted first to honor "reason" in a theater, but then an infernal thought came to them and they went to Notre Dame Cathedral. A dancer from the opera was seated on a throne in the sanctuary; and girls adorned with wreaths of oak leaves sang anthems in honor of the new religion. The treasures of the church were piled upon a donkey, a bishop's miter was placed upon its head, the sacred vessels were placed before it, and the people danced around it. From the sacred chalices they drank brandy, and served herrings from other consecrated vessels. Simliar incidents took place in other churches.

And what was the end of all this? The guillotine blade rose and fell from morning to night. The executioners became weary of murdering. In the last months of 1793 in the neighborhood of Nantes alone, the number of beheaded, shot, and drowned was at least fifteen thousand. This is what happens to a nation that scoffs at Faith.

Take away God, then there will be no one whose commands bind unbridled human instincts, and the nation will become one big gang of thieves and assassins.

Take away God, then there will be no difference between good and evil; then every passion will be unrestrained.

Take away God, then every honest man, every charitable, compassionate, merciful man is a fool, a lunatic at large.

If history proves nothing else, it proves that the support and foundation of every state is the moral law. George Washington said: "Political prosperity rests on two main supports: religion and morality." It is vain for a people to be victorious in war, in commerce, and in industry if it is not also victorious in moral life.

On October 6, 1849, the thirteen martyrs of Arad met their death. One of them, General Schweidel, former governor of the citadel of Buda, after the death sentence and shortly before his execution, turned to the regimental chaplain and said: "Chaplain, here is the cross I inherited from my father. Always, even in time of battle, I carried it with me. Please give it to my son." But, as if something had flashed into his mind, he took it back again saying: "I wish to hold it in my hands as I die. After I am dead, do not hesitate to take it out of my hands and give it to my son."

The rifles spoke, and the general was dead. But such a nation cannot be lost where the fathers teach love of God and faith in Him to their sons.

May our beloved nation be mindful of its great spiritual heritage, especially in these critical days of national crises.

Let us never forget that he who has lost his fortune, has lost much; he who has lost his arm, has lost still more. He who has lost his faith, has lost all.

Chaplain (Col.) Joseph S. Chmielewski
CDC Staff Chaplain

They call him "Mr. Attack Helicopter."

The boyish-looking 34-year-old Army officer is Major Gary Dolin, currently assigned to CDC's Armor Agency, Ft. Knox, Ky. He is a graduate of Georgia Tech with a B.S. in Chemistry. He worked as a research chemist for the Monsanto Co. after graduating from Tech in 1961.

His military experience began in 1954 when he served for four years as a photographer for the U.S. Air Force. Major Dolin has had two tours in Vietnam and among the personal awards are the Silver Star, 4 Distinguished Flying Crosses, 2 Bronze Stars, Purple Heart, and 59 Air Medals. He has over 3,100 hours of combat flying, mostly with the attack helicopters, and over 6,000 hours altogether since 1965.

His vast experience and knowledge of attack helicopters was the major reason for his being assigned within the CDC agency to write the training texts for attack helicopter units.

Arrowhead *visited with Major Dolin to discuss the attack helicopters.*

Arrowhead: Why is the Armor Agency concerned with the attack helicopter project?

Dolin: First, we are vitally concerned with all aspects of Armor and anti-armor employment. The attack helicopter, configured for hard, point targets, is found in air cavalry units for which the Armor Agency is proponent. Normally, Armor is the proponent for the Air Cavalry Combat Brigade, which depends largely on the attack helicopters for the accmplishment of its mission.

Arrowhead: We hear so much about the possible addition of the Cheyenne helicopter to the

MAJOR DOLIN CHAMPIONS THE ATTACK HELICOPTER

inventory of attack helicopters. How would you compare it with the Cobra attack helicopter?

Dolin: Well, you see we have a complete integrated fire control system with the Cheyenne that we don't have with the Cobra. And, let's face it, the bird is much more accurate, faster, safer—and for what it was designed to do, it's the best bird. But there is still a place for the Cobra in the inventory, too, because the Cobra is a little smaller and probably easier to maintain. So there is really a place for both aircraft.

Arrowhead: Do you think the Huey gunships will be phased out as an attack helicopter?

Dolin: Yes, I think after the life cycle of the aircraft it probably will be phased out as an attack helicopter because the attack helicopter must be a much more stable aircraft. It was Napoleon who said, "Every Army must change in tactics every 10 years." This applies also to the life cycle of a military aircraft. The attack helicopter takes a heavier beating than, say, a command and control ship. It should also be noted that the Huey is a utility craft and never designed specifically as an attack helicopter.

However, the Huey has performed admirably as a gunship. I enjoyed flying the UH–1C. It was great having a door gunner and crew chief back there—two more pair of eyes and, let's face it, you've got two machineguns on the doors, MGs on the sides and rocket pods—that's an awful lot of armament. You had the ability behind you to fire back if you were fired upon from the rear and you didn't have to traverse the whole ship to do it. For surveillance purposes the ship was fantastic—eight eyes instead of four. But the Huey couldn't give you the speed, turn around time, and load factor that a true attack helicopter requires.

Arrowhead: What sort of armor protection does the attack helicopter require?

Dolin: Of course, there is armor in the seats, the chestplate, better known as the "chicken plate," and armor protection in critical areas of the aircraft, such as the fuel system. Since the Cheyenne has more critical areas and is larger than the Cobra, it will be carrying more armor protection. When you protect the critical areas of the aircraft, you enhance its life span. Armor protection is really relative because if, for example, you could give me a helicopter blade that a round or shrapnel could go through and wouldn't affect the aerodynamics of the blade, I could care less if it's armored protected.

"What the ultimate ACCB organization will look like, we don't know yet."

Arrowhead: Then is the rotor blade a critical area?

Dolin: Not necessarily. You can fly without a few inches of blade. You can get a big rip in it and the aircraft will still fly. It's not a comfortable ride, but she'll fly.

Arrowhead: How will the attack helicopters be employed in the Air Cavalry Combat Brigades (ACCB) of TRICAP and MASSTER and what will be the organization structure?

Dolin: First of all, we feel the ACCB can be used to do a job as a reaction force in a mid-intensity war and will not be hampered by congested roads and other hazards we might find. One of the missions of the ACCB is to destroy enemy mechanized forces by aerial-mounted combat in conjunction with armored, mechanized, or airmobile forces.

What the ultimate ACCB organization will look like, we don't know yet. This is what we'll have to come up with and, until Project MASSTER testing is completed, we won't know. Currently, the platoon test of the Air Cavalry Attack Squadron is being done in the MASSTER ACCB–1 test. When the MASSTER ACCB–2 Troop Test begins, so will the first TRI–CAP test. If we find out that in MASSTER 1 something will or won't work in ACCB, we certainly have to reflect this in ACCB–2 and TRI–CAP. So it's just going to be somewhat of a learning process.

Last summer, experiment 43.5, Basic Attack Helicopter Team (BAHT), was conducted at CDCEC. (See the July 1971 *Arrowhead.*) One of the objectives of the experiment was to determine how many attack helicopters and scout craft we needed in the BAHT. All kinds of mixes were tried: 4 scouts and 1 attack, 2 scouts and 2 attack, 2 scouts and 1 attack, and 0 scouts and 2 attack, to name a few. However, we still feel that the basic attack unit is the platoon. TRI–CAP and

MASSTER will tell us what the total organization should be.

I also think MASSTER will tell us what the span of control will be, or how many attack helicopters and scouts the platoon commander can control. We have some feel for the problem with our experience with the air cavalry troops in Vietnam.

Arrowhead: Do you foresee the Air Cavalry attack helicopter used in the role of an artillery platform?

Dolin: No, I don't. We don't consider within the ACCB the use of the attack helicopter of the air cavalry attack troop or the air cavalry attack squadron as artillery. They maneuver in the same fashion as tanks would maneuver—the only difference is that we added a vertical dimension. To tie down the attack helicopter and the ACCB organization to an artillery platform role would be counter productive. The ACCB and its elements have to maneuver towards the enemy as would a tank or infantry unit but definitely not like D.S. (Direct Support) or G.S. (General Support) artillery.

Arrowhead: Would the Air Force fly cover for the attack helicopters?

Dolin: Sure. This is something that we really want to stress. The attack helicopter is part of a combined arms team concept that has to be employed with artillery, tactical air, and ground maneuver units. Because, say, you go out by yourself and attack an enemy armor formation with just attack helicopters—everybody there is looking for attack helicopters and looking to the sky. But if

Using a terrain board, Major Dolin (right) points out a possible attack helicopter employment against an enemy armor unit. Two attack helicopters (below) are shown attacking targets at ground level with "fire and forget" missiles, while scout, attack, and troop helicopters used in conjunction are depicted (above). The sleek Cheyenne (pages 24-25) lurks close to the terrain in a test flight.

you open up on them with the artillery you have and you keep them buttoned up, then you have ground and armor weapons firing at the enemy—you know they've got to watch out for those. They have to look out for mines and they have to be aware of high performance aircraft coming in on top of them. With these weapons keeping the enemy occupied, we gain additional opportunities for engagement. It's got to be a combined effort!

Arrowhead: What problems have arisen in putting together CDC's training texts for attack helicopter pilots?

Dolin: We have found that the most difficult procedure in instructing the pilots in the training texts is the handoff procedure or transfering a target from a scout helicopter to an attack helicopter with the minimum of time and with minimum exposure. Also a unique situation confronts us in putting out these training texts. The idea of the attack helicopter is still very new and technology is still improving, and new concepts constantly evolving, so that by the time we came out with the first edition of the training text, TT–17–37–5, it required revision.

We have also found that the attack helicopter crewman has got to be more than a pilot, he's got to be a competent commander. He's got to understand what is going on the ground with the maneuver units. For instance, in a defensive posture with a maneuver unit, you've got to understand what the defensive objectives and mission are. To understand this the air commanders have to know the troop leading procedures—really, the whole ball of wax. Once he comprehends this, then it is easy to employ the attack helicopter.

Another thing that needs mentioning is the aviation instruction currently being given to helicopter pilots. In a future war, especially a mid-intensity conflict, we will be flying the nap of the earth. Navigational instruction needs to be emphasized in pilot training. Low level flight training is also needed. The pilot has got to be proficient in the aircraft and has got to feel at home in the environment because you've got too much damned work to do in the cockpit to have to think about flying the aircraft all the time. That must become second nature.

> **"The attack helicopter crewman has got to be more than a pilot, he's got to be a competent commander."**

There are two main thoughts that I preach when I'm up on my soapbox: intelligence and mobility.

Intelligence, or where the battle will take place, is of vital importance. For example, if you were attacking an enemy tank platoon, you just can't charge out there and zap them because you don't know what piece of the formation you are attacking. You might have to fly over two or three other tank platoons to get to the tanks you've just seen. So you have to determine what formation or complete array you're attacking, and only then can you get the job done. You can't get to the center of this thing if you can't penetrate the peripheral—you have to work your way in.

Mobility is the second point I harp on: getting a unit into battle quickly over a congested avenue of approach to engage the enemy is the key to future battle field success. This is why the ACCB was developed.

My personal position is: I'm in armor and I'm going to benefit either as an aviator or as a tanker, and if the attack helicopter doesn't work, then we buy more tanks. But CDC and the Army owe it to themselves to see if the ACCB can work.

And there is no doubt in my mind that it will work!

Arrowhead: Thank you, Major Dolin.

Hospital continued

mobility ("We measured certain parameters in connection with this move"), sits back in his chair and lights his cigar, shaking the match out. He raises a few quick clouds of smoke, then continues:

"Phase II is principally an internal test. This is an evaluation of the internal operations of the modular structure in the treatment of actual patients provided by William Beaumont General Hospital.

"There are a number of positive factors regarding the hospital that we have uncovered so far. One, we have found out for the first time that this hospital is mobile in a tactical environment. The MUST acronym does not of itself state 'mobile.' We have determined that the equipment *is* mobile and can be moved at reasonable speeds—and that the equipment will stand up.

"Second, it looks like it will take about 24-36 clock hours to set up the full hospital once it moves to a new location. It appears that you can pull down a portion of the hospital, move it, and set it up again to receive patients in about 10-12 clock hours."

The hospital consists of more than a dozen inflatable, quonset structures made up of 13-foot-long elements. Nine turbine-powered utility packages—which also supply air for pressurization, heat, or air-conditioning, electrical power, and hot and cold running water—pump air into foot-wide section cells and four sections plus an intermediate T-section are zippered together to form a 20x65 ward.

According to CDC's Major Robert Cloke, head of the agency's Troop Test branch: "You can take a patient out of a hot, rainy environment or a cold, wet environment and bring him into the hospital and, once he's inside, it's just like a modern hospital. It's been tested up to about 135 degrees and down to about 35–40 degrees below."

What, then, were some of the problem areas encountered in the evaluation? Col. Lindsey leans forward on his elbows, hands clasped. "It's my feeling that the staffing of the hospital at the working level is very thin. The number of men available to pick up 450-pound tent sections, move them to a proper location, get them inflated, drive in tent pins, unfold the beds, string the air-conditioning ducts, and so on is so austere that it will be very difficult to move this hospital and operate it at the same time.

"There are also several major items of equipment that are essential to this hospital that are not included in the TOE.

"One, we need a 15,000-pound rough terrain forklift. We could save several hours in setup time if we had a forklift to move around the expendables and ward containers after they had been unloaded from the trucks or dollies.

"Two, we are short on fuel-carrying capacity. The TOE provides only a 2½-ton truck carrying two 600-gallon fuel tanks—and this is only enough fuel to operate this hospital for three hours. So we're completely dependent on a prior-arranged, thoroughly dependable fuel supply in a new location—or we have to be located close enough to a fuel supply so that our own fuel truck can make a round-trip run in something less than three hours.

"Three, we need some sort of front-load or scoop vehicle to level and smoothe the terrain, provide excavation for kitchen sumps, foxholes, latrines, and so on, and supply revetment for the hospital."

The final report on the project is due at CDC Headquarters by October 1, after Col. Lindsey and his staff spend three months sifting through objectives, sub-objectives, and essentials of analysis in order to make their recommendations.

"We will continue to evaluate this data through computer studies, systems analysis, and round-table discussions with experts. For example, when we get back to Ft. Sam Houston we expect to cut out a bunch of blocks and play with these blocks on a sand table," explains the colonel, tracing a smoke-picture in the air wit hhis cigar, "to determine optimum methods of building up a hospital in a new location from a small increment to an expanded hospital."

Whatever the outcome from the Combat Support Hospital, the Army is striving to ensure that the soldier of tomorrow continues to be provided with the most modern medical treatment and facilities available.

Spot Reports

New DCO at CSA

FT. BELVOIR, Va. . . . Colonel Frank S. Caruso has been assigned as Deputy Commanding Officer of the U.S. Army Combat Developments Command Systems Analysis Group.

In his new assignment, Col. Caruso will act for the Commander, and assist him in the accomplishment of assigned missions and tasks. In addition, he will coordinate the administrative activities of the Group.

The Systems Analysis Group provides operations research, systems analysis, and related scientific support to USACDC which provides field technology for the Army of the tomorrow.

A graduate of the United States Military Academy, Col. Caruso entered the service in 1946 as a Second Lieutenant, and since has served in numerous Command and General Staff assignments. He received a MA degree in Journalism from the University of Alabama. His most recent assignment was Commanding Officer, US Army Exhibit Unit, Cameron Station, Alexandria, Va.

Soft Lenses

FT. BELVOIR, Va. . . . A soldier who breaks his eyeglasses while using optical-lens equipment represents a possible double tragedy: he may suffer eye damage and the Army may lose a highly-skilled specialist.

The answer may be in the proposal by CDC to look for "spectacle substitutes" for soldiers who must work with sophisticated surveillance, targeting, and other devices. Ordinary contact lenses may not be the full answer, claims CDC, eyeing a principal called the "soft" lens.

These are flexible silicone rubber lenses which appear to meet many of the required characteristics such as safety, comfort, stability, and continuous wear for a minimum of five days in a military environment.

Data in CDC's studies and surveys indicate that some 35 percent of our soldiers wear glasses (26 percent came into the Army wearing them). Also listed are some 92 optical sights and devices that a soldier with glasses would have difficulty operating, or that he could handle more effectively with "soft" spectacles.

Group Celebrates

FT. MONMOUTH, N.J. . . . On 1 June, the CDC Communications-Electronics Agency celebrated its ninth anniversary with an organization day picnic and a full round of events, including intra-agency softball and volleyball games.

The agency, commanded by Colonel James P. Mattern, was initially activated at Ft. Hauchuca, Ariz., on 1 June 1962 with elements at Ft. Monmouth. The Hauchuca elements moved to Ft. Monmouth and consolidated on 1 November 1964. The agency is staffed with 115 persons, including 63 civilian employees, most of whom are professionals in the communications and electronics field.

The agency is primarily concerned with the development of communications-electronics concepts, doctrine, organizations, and materiel requirements for support of the army in the field.

Warming Whirlpool

FT. BELVOIR, Va. . . . Who worries about frostbite in the middle of August? The Army—that's who. And, in particular, CDC, which has been tasked with an Army requirement for development of a Cold Injury Rewarming and Treatment System.

The idea is to get a hospital-type "whirl-pool" warming bath as near the frost-injured soldier as his Battalion Aid Station. This will get rewarming and massage of frozen extremities started as soon as possible to prevent more serious injury and infection.

The rewarming system desired by CDC should be capable of circulating water in a tank at a steady 104-degrees, yet the empty tank, heater, and all devices should not weigh more than 10 pounds, with most of it going into a three-cubic-foot suitcase.

Based on a CDC-directed study, "Medical Operations in Northern Area," the requirement notes that water warms human flesh four times as fast as air. In addition, this highly mobile system will contain a surgical detergent to minimize infection and speed recovery.

According to CDC cold weather experts, it will also have its own pressure temperature controls, "Fail-safe," and alarm systems.

New Commander

FT. McCLELLAN, Ala. . . . Colonel Kenneth L. Stahl assumed command of the CDC Chemical-Biological-Radiological Agency in June.

Colonel Robert L. Andreoli, the agency's former commander, is now assigned to Vietnam.

No stranger to Ft. McClellan, this is the colonel's third assignment here. His last tour was as Commanding Officer of the 100th Chemical Group in 1968–69.

The Colonel entered the Army in 1943 as an enlisted man in the Signal Corps and served on Okinawa with the Tenth Army. Discharged in 1946, he attended the University of Wisconsin and earned his Master of Science degree in Bacteriology from the same university in 1956. He is also a graduate of the Industrial College of the Armed Forces and the Army War College.

During his varied military career, in addition to Okinawa and Ft. McClellan, Col. Stahl has had assignments at Ft. Carson, Colo., Japan, Washington, D.C., London, and Vietnam.

PALS Celebrate

FT. LEE, Va. . . . On 1 July 1971 the Combat Developments Command Personnel and Logistics Systems Group (PALS) celebrated its ninth anniversary.

While it is true that the Group is concerned with the Army of the future, its concern for the future directly affects the well being of the soldier today.

With the movement towards a Modern Volunteer Army, more emphasis has been placed on the individual soldier and his particular needs than ever before.

To accomplish these tasks the PALS group has seven subordinate agencies whose work is directed towards improving the conditions under which the individual must serve. These agencies, spread throughout the country, carry out a multitude of tasks assigned by Headquarters, Combat Developments Command and the Department of the Army. Some of the high priority projects underway at this time are as follows:

The Medical Service Agency at Ft. Sam Houston, Tex., is studying ways to improve medical treatment and facilities which the Army provides to the soldier in the field. This includes medical evacuation, field treatment facilities, shelter systems and medical service in general.

The Supply Agency, located here, is working on the effective methods for the mass feeding of troops through an Electronic Energy Diffusion unit, commonly known as the SPEED Kitchen. At the present time this kitchen is undergoing testing at Ft. Jackson, S.C. During the test, large numbers of troops are being fed in groups from 100 to 350 men at a time with detailed records being kept on the overall efficiency and quality of food preparation.

With the influx of new and highly specialized equipment for the Army in the field, the Group's Maintenance Agency, located at Aberdeen Proving Ground, Md., has the task of insuring that authoritative manuals are prepared that provide methods and systems for maintaining this equipment.

The Transportation Agency at Ft. Eustis, Va., has been deeply involved in studying methods of rapid transportation of supplies to the men in the field. One of these, the Trans-Hydro Craft study deals strictly with a more effective means of transporting supplies from ships to shore.

Besides meeting the physical needs of our soldier in the field, PALS Group, through its Chaplain Agency, also located here, and its Judge Advocate Agency at Charlottesville, Va., takes care of the spiritual and legal needs of the modern soldier.

The Personnel and Administrative Services Agency, located at Ft. Benjamin Harrison, Ind., has as its primary study the "Personnel Offensive." The objectives of this study are to determine the factors that make an individual effective in combat and how to capitalize on the characteristics of today's youth in performing the Army's mission. When this study is completed it will materially contribute to the goals of a Modern Volunteer Army.

As Lieutenant General John P. Daley, first Commanding General of the Combat Developments Command said, "The future will demand all the professional knowledge, skill, judgment and vivid imagination we possess."

In this light, PALS Group and its agencies look forward to meeting the challenges of the present as well as the future.

Creative Thinking

FT. BELVOIR, Va. . . . A proposal for a device to save the Artillery soldier injuries and extra work has won a young Army officer the Creative Thinking Award sponsored by Combat Developments Command (CDC).

Captain Eric C. Deets, attending the Field Artillery School at Ft. Sill, Okla., is now constructing a prototype of a press-like tool to quickly field-repair dented 105 millimeter artillery canisters (shell cases).

The canisters, which hold the powder charges for the projectiles, are often damaged in combat after the shells are uncrated near the gun emplacements or when delivered loose in helicopter slingloads. An average gun battery, CDC notes, may have 20 to 30 dented cases per week which may be forced (rammed) into the gun and fired. However, they must be manually extracted, not without danger to the crewmen and delay in the fire support missions.

With Deet's innovation, the powder bags are removed from the case and a device like a piston encircles and inserts the case, pressing out the dents right at the gun site. The same case can then be used immediately without risking accident or returning the shell all the way back to an ammunition point.

Thinkers Award

FT. LEAVENWORTH, Kan. . . . Research papers recommending improvements in water pollution control, nontactical telecommunications management, and prediction of electronic equipment component failure have won three Army Command and General Staff College (CGSC) students CDC Creative Thinking Awards.

Receiving Creative Thinking Awards were Majors James G. Johnson, Billy M. Thomas, and Raymond E. Starsman. Each received a $100 cash award, a miniature replica of Rodin's bronze statue "The Thinker," and a Certificate of Achievement signed by Lieutenant General John Norton, CDC Commanding General. The three officers were presented the awards by Major General John J. Hennessey, Commanding General of CDC's Institute of Combined Arms and Support and CGSC Commandant, during graduation exercises in June.

Their winning papers were three of a record 56 submitted in the 1971 Creative Thinking Award Contest. Because of the quality of entries, three awards were given; only one award was given in previous years.

Maj. Johnson won his award for his research paper titled, "The Corps of Engineers: A Candidate for Centralized Control Responsibility of Water Pollution."

Maj. Johnson concludes that "failure to further consider and implement the concept of centralized management of pollution abatement will result in the creation of major health dangers to the United States, the depridation of streams and lakes, and the corresponding destruction of beneficial aquatic life and fish life, and pollution to such an extent that water would, in effect, become unusable." He adds, "The Corps of Engineers is the most feasible agency to head pollution abatement."

Maj. Thomas' winning thesis, titled "An Evaluation of the Nontactical Telecommunications Requirement Cycle," discusses existing nontactical telecommunications requirements and management procedures. It concludes that USASTRATCOM needs to play a more active role in all phases of management in this area in order to improve the efficiency, effectiveness, and economy of the nontactical telecommunications program.

Maj. Starsman's thesis was titled, "A Proposed Mathematical Model for Predicting Military Electronic Component Failure Rates and Isolating Underlying Failure Causes." In the study he proposes a general mathematical model which, he says, will predict military electronic equipment component failure rates more precisely than current models and provide a mathematical means of isolating the underlying causes of component failure.

Each of the officers will have an opportunity to apply his ideas in his next assignment. Maj. Johnson has been assigned as military assistant to the Chief of Operations for Water Pollution, Huntington, W. Va., District Engineers Office; Maj. Thomas is headed for Ft. Gordon, Ga., and the Signal School; and Maj. Starsman is being assigned to the Safeguard System Office in Washington, D.C.

CO Honored

FT. EUSTIS, Va. . . . Colonel Robert L. Hoffman, Commanding Officer of the Combat Developments Command Transportation Agency, located here, was recently awarded the Second Oak Leaf Cluster to the Legion of Merit.

Brigadier General Ross R. Condit, Jr., Commanding General, Combat Developments Command Personnel and Logistics Systems Group, made the presentation.

Colonel Hoffman has departed for a new assignment in Korea.

Fog Clearing

FT. BELVOIR, Va. . . . A means for clearing supercooled fog from an area one kilometer long and 100 meters wide is being looked at by CDC Headquarters here.

The system that CDC envisions for Army airfields located above 40 degrees north latitude would dispense propane into the atmosphere as an aerosol.

Supercooled fog is composed of droplets of water suspended in air at 32 degrees or below which can be triggered and released by the propane spray.

The tank, valves, and nozzles for the propane dispenser would be truck-mounted, but CDC's requirements-writers also recommend it be man-portable and capable of being air-dropped and operated from an Army aircraft.

Scientific Advisor Attends National War College

Environment, foreign area studies, national strategy and other academic tasks will for one year replace scientific panels, conferences and symposia for Mr. David C. Hardison, 43, Scientific Advisor for Combat Developments Command (CDC).

Mr. Hardison was selected to attend the National War College, located at Ft. McNair in Washington, D.C., and departed CDC headquarters in late July.

The War College presents a curricula on national security policies and strategy to selected senior officers and civilians from the military services and government agencies. Competition for the school is keen and selection is considered a signal honor.

Mr. Hardison joined CDC as its Scientific Advisor in 1964, transferring from the Ballistic Research Laboratories (BRL) at Aberdeen, Md., where he had been a mathematical analyst. While at BRL, he had line responsibility for the U.S. weapons evaluation programs in the area of armored vehicles and for weapons used mainly against armored vehicles.

Later he became Deputy Chief of Weapons System Laboratory where he was involved with assessment work of all weapons of the U.S. Army. During his work of more than a decade at BRL, he published numerous technical reports and he originally conceived several major weapons which now are in various stages of development, production and operation.

While at CDC, Mr. Hardison was the driving force behind a plan to build a small civilian staffed operational research/systems analysis (ORSA) team at key locations in the command. The purpose of this, he said, was to "make CDC more nearly self-sufficient technically."

"Also," Mr. Hardison added, "we wanted an environment which would stimulate growth in areas of knowledge directly contributing to Combat Developments."

Much of the progress at CDC's instrumented field laboratory at Hunter Liggett Military Reservation, including the new Direct Fire Simulator System (see page 2 of this issue) can be attributed to the leadership of Mr. Hardison.

He won the Department of Army Meritorious Civilian Service Award in 1964 and earned the D.A. Exceptional Civilian Service Award in 1968. Other awards include the Army Research and Development Achievement Award in 1963, and five consecutive Outstanding Performance Awards, the latest coming in 1970.

Mr. Hardison is a native of Arapahoe, N.C. He obtained his BA degree from Atlantic Christian College in North Carolina, and his Master's Degree from Duke University. He also has completed additional graduate courses at the University of Delaware. His specialty field is operations research and weapons systems analysis.

He is married to the former Elizabeth Leach of Wilson, N.C. They have two children.

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